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1 1. An apparatus used with an electronic camera of
2 the type associated with an electronic shutter which
3 controls an image sensor, the apparatus comprising image
4 size detection circuitry, which is responsive to electrical
5 signals received from the electronic camera, for determining
6 an actual image area within a total image area of the image
7 sensor, and generating a control signal, based on the actual
8 image area, for controlling the electronic shutter.

1 2. The apparatus of claim 1 wherein the electronic
2 camera has a plurality of predefined shutter response areas,
3 each shutter response area defining different portions of
4 the total image area of the image sensor, said control
5 signal selecting one of the shutter response areas, and said
6 electronic shutter controlling said image sensor in response
7 to the selected one of the shutter response areas.

1 3. The apparatus of claim 2 further comprising a
2 processor and a memory for storing data associated with the
3 plurality of predefined shutter response areas of the
4 electronic camera.

1 4. The apparatus of claim 3 wherein the electrical
2 signals includes a luminance component used by the image
3 size detection circuitry to determine the portion of the
4 total image area of the image sensor containing the actual
5 image.

1 5. The apparatus of claim 4 wherein the image
2 detection circuitry includes:
3 a comparator configured to receive the luminance
4 component of the electrical signals and generate a first
5 output signal representative of a portion of the total image
6 area;
7 an integrator, connected to the comparator, for
8 receiving the first output signal from the comparator and
9 generating a second output signal representative of the
10 actual image area; and
11 an analog to digital converter which receives the
12 second output signal from the integrator and generates a
13 digital signal, representative of the actual image area for
14 selecting data associated with one of the plurality of
15 predefined shutter response areas stored in said memory.

1 6. The apparatus of claim 1 wherein the image
2 sensor includes a charge-coupled device having an array of
3 photoelectric cells.

1 7. A medical instrumentation system comprising:
2 a medical viewing instrument for viewing an object
3 under observation;
4 an electronic camera optically coupled to the
5 medical viewing instrument, for generating electrical
6 signals representative of an actual image viewed by the
7 electronic camera said electronic camera associated with an
8 electronic shutter which controls an image sensor;
9 image size detection circuitry, responsive to
10 electrical signals received from the electronic camera, for
11 determining an actual image area within a total image area
12 of the image sensor, and generating a control signal, based
13 on the actual image area, for controlling the electronic
14 shutter.

1 8. The medical instrumentation system of claim 7
2 wherein the electronic camera has a plurality of predefined
3 shutter response areas, each shutter response area defining
4 different portions of the total image area of the image
5 sensor, said control signal selecting one of the shutter
6 response area, and said electronic shutter controlling said
7 image sensor in response to the selected one of the shutter
8 response areas.

1 9. The medical instrumentation system of claim 8
2 further comprising a processor and a memory for storing data
3 associated with the plurality of predefined shutter response
4 areas of the electronic camera.

1 10. The medical instrumentation system of claim 9
2 wherein the electrical signals includes a luminance
3 component used by the image size detection circuitry to
4 determine the portion of the total image area of the image
5 sensor containing the actual image.

1 11. The medical instrumentation system of claim 10
2 wherein the image detection circuitry includes:

3 a comparator configured to receive the luminance
4 component of the electrical signals and generate a first
5 output signal representative of a portion of the total image
6 area;

7 an integrator, connected to the comparator, for
8 receiving the first output signal from the comparator and
9 generating a second output signal representative of the
10 actual image area; and

11 an analog to digital converter which receives the
12 second output signal from the integrator and generates a
13 digital signal, representative of the actual image area for
14 selecting data associated with one of the plurality of
15 predefined shutter response areas stored in said memory.

1 12. The medical instrumentation system of claim 7
2 wherein the image sensor includes a charge-coupled device
3 having an array of photoelectric cells.

1 13. A method of controlling an electronic shutter
2 used with an image sensor of an electronic camera, the
3 method comprising:

4 receiving electrical signals from the electronic
5 camera,

6 determining, in response to the electrical signals,
7 an actual image area within a total image area of the image
8 sensor; and

9 generating, based on the determined actual image
10 area, a control signal for controlling the electronic
11 shutter.

1 14. The method of claim 13 wherein the electronic
2 camera has a plurality of predefined shutter response areas,
3 each shutter response area defining different portions of
4 the total image area of the image sensor, and controlling
5 the electronic shutter further includes selecting one of the
6 shutter response areas.

1 15. The method of claim 14 wherein the electrical
2 signals includes a luminance component for determining the
3 portion of the total image area of the image sensor
4 containing the actual image.

1 16. The method of claim 15 wherein determining an
2 actual image area occupying a total image area of the image
3 sensor includes:

4 comparing the luminance component of the electrical
5 signals with a predetermined threshold value and generating
6 a first analog output signal representative of a portion of
7 the actual image area occupying the total image area;

8 integrating the first output signal and generating a
9 second analog output signal representative of the actual
10 image area; and

11 converting the second analog signal to a digital
12 signal representative of the actual image area for selecting
13 data associated with one of the plurality of predefined
14 shutter response areas.

1 17. The method of claim 13 wherein the image sensor
2 includes a charge-coupled device having an array of
3 photoelectric cells.

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